CALIFORNIA DIVISION OF MINES AND GEOLOGY

FAULT EVALUATION REPORT FER-23

DECEMBER 28, 1976

1. Name of fault: Ozena fault (south part)

2. Location of fault: Reyes Peak and Rancho Nuevo Creek 7.5' quadrangles, Ventura County.

3. Reason for evaluation: Part of a 10-year program; zoned in Ventura County's Seismic and Safety Element (Nichols, 1974).

4. List of references:

a) Dibblee, T.W., Jr., 1946, Unpublished mapping of the Reyes Peak quadrangle, 1:31,680.

b) Dibblee, T.W., Jr., 1971, Geologic map of the "Ventacopa" 15' quadrangle: California: U.S. Geological Survey, Open-file map, scale 1:62,500

c) Dickinson, W.R., 1969, Geologic problems in the mountains between Ventura and Cuyama in Upper Sespe Creek field trip guide: Pacific Coast Section Society of Economic Paleontologists and Mineralogists, p. 1-8.

d) Exum, F.A., 1957, Geology of a portion of eastern Cuyama Valley, Ventura and Santa Barbara Counties, California: Unpublished M.A. thesis, University California,Los Angeles.

e) Frankes, L.A., 1959, The geology of the Quatal Canyon area, Kern, Ventura, and Santa Barbara Counties, California: Unpublished M.A. thesis, University of California, Los Angeles.

f) Jennings, C.W., 1975, Fault map of California with locations of volcanoes, thermal sorings, and thermal wells: California Division of Mines and Geology, California Geologic Data Map Series, Map No. 1, scale 1:750,000.

g) Jennings, C.W. and Strand, R.G., 1969, Geologic map of California, Los Angeles sheet: California Division of Mines and Geology, scale 1:250,000.

h) Larson, E.E., 1958, The geology of the Potrero Seco area, Ventura County, California: M.A. thesis, University California, Los Angeles, 100 p., geologic map scale 1:16,000.

i) Nichols, D.R., Oct. 1974, Surface Faulting in General Discussion in Seismic and Safety Elements of the Resources Plan and Program, Ventura County Planning Department, section II, p. 1-35, pl. 1.

j) Poynor, W.D., 1960, Geology of the San Guillermo area and its regional correlation, Ventura County, California: M.A. thesis, University California, Los Angeles, 119 p.

k) Stanford Geological Survey, 1966, Geology of the Reyes Peak-Wagon Road Canyon area, Ventura County, California: unpublished, geologic map 1:24,000 scale.

l) Vedder, J.G., Dibblee, T.W., Jr., and Brown, R.D., Jr., 1973, Geologic map of the upper Mono Creek-Pine mountain area, California showing rock units and structures offset by the Big Pine fault: U.S. Geological Survey, Miscellaneous Geologic Investigations Map I-752, scale 1:48,000.

m) Weber, F.H., Jr., Kiessling, E.W., Sprotte, E.C., Johnson, J.A., Sherburne, R.W., and Cleveland, G.B., 1975 (Preliminary draft of 2/27/76), Seismic hazards study of Ventura County, California: California Division of Mines and Geology, Open File Report 76-5 LA, 396 p., 9 plates, map scale 1:48,000.

5. Summary of available data:

The Ozena fault is zoned as a secondary fault hazard in the Ventura County Seismic and Safety Element (Nichols, 1974). Essentially all faults shown by Jennings and Strand (1969) were zoned in the Element. Apparently no attempt was made by Nichols to determine which faults were active, potentially active, or inactive for purposes of the Element.

Exum (1957), p. 64 notes that the Ozena fault is a high angle reverse fault, dipping 78° to the west, which is "terminated against" the Big Pine fault on the south. He states that the fault does not cut terrace gravels (presumed to be late Quaternary in age). He describes the surface expression of the fault as a "highly dissected fault-line scarp" (p. 67). He states (p. 72) that there has been major movement along the Ozena fault since the Pliocene.

Frakes (1959) agrees with Exum, in part. He, too, maps the Ozena fault as buried under alluvium (the only Quaternary unit on his map). He notes that the fault is a high angle reverse fault zone; the maximum width of the zone is 75 feet, but it is more commonly about 10 feet wide. Frakes estimated 1,000 feet of vertical displacement has occurred along the Ozena fault.

Poynor (1960, pl. 2) also maps the Ozena fault as concealed under terrace deposits (Quaternary). The youngest unit cut is Quatal Formation (upper Miocene). Poynor implies that the Ozena fault was once a strike-slip fault, but was unable to determine the amount of slip.

The Stanford Geological Survey (1966) map depicts the Ozena fault as concealed under Quaternary terrace gravels. The youngest unit

shown as cut is alluvium, but this is most likely a drafting error (since it is concealed under nearby terrace deposits). If this is an error, then the youngest unit cut by the fault is Morales Formation (Pliocene).

Dibblee (1946, 1971) depicts the fault as concealed by Holocene alluvium. The youngest unit cut is Quatal Formation (upper Miocene). Vedder, Dibblee, and Brown (1973) depict the fault as concealed beneath older alluvium (Pleistocene in age) as well as Holocene alluvium.

Jennings (1975) depicted the Ozena faults as Quaternary in age after Dickinson (1969, p. 8) who notes that the Cuyama and Ozena faults have had "movement histories dominated by Plio-Pleistocene dip-slip.

Weber, et al (1975, p. 178) notes that the youngest unit apparently displaced by the Ozena fault in the Ventura County area is Quatal Formation (Pliocene age). They also cite Jennings (1974 Preliminary version of 1975 map); and they further note that geomorphic features along the fault are not definitive. They assign an age of Quaternary (?) to the Ozena fault.

6. Interpretation of air photos:

U.S. Geological Survey aerial photos flight WRD-506, numbers 7423-7425, scale 1:24,000, flown in 1967, were viewed stereoscopically. These photos cover just the southern-most part of the Ozena fault, where it is truncated by the Big Pine fault. No features common to active faults were noted. No attempt was made to obtain other aerial photographs in light of the information contained in Weber, et al (1975).

7. Field observations:

Time did not permit a detailed study of the Ozena fault. A cursory examination of the area where the fault supposedly crosses state

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IAN CAMPBELL, CHIEF
GORDON B. OAKESHOTT, DEPUTY CHIEF

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF CONSERVATION

Segment of Ozena Fault evaluated in FER-23.

Observations were made along this segment of the fault.

Figure 1. The Ozena Fault. (From Jennings and Strand, 1969, scale 1:250,000).

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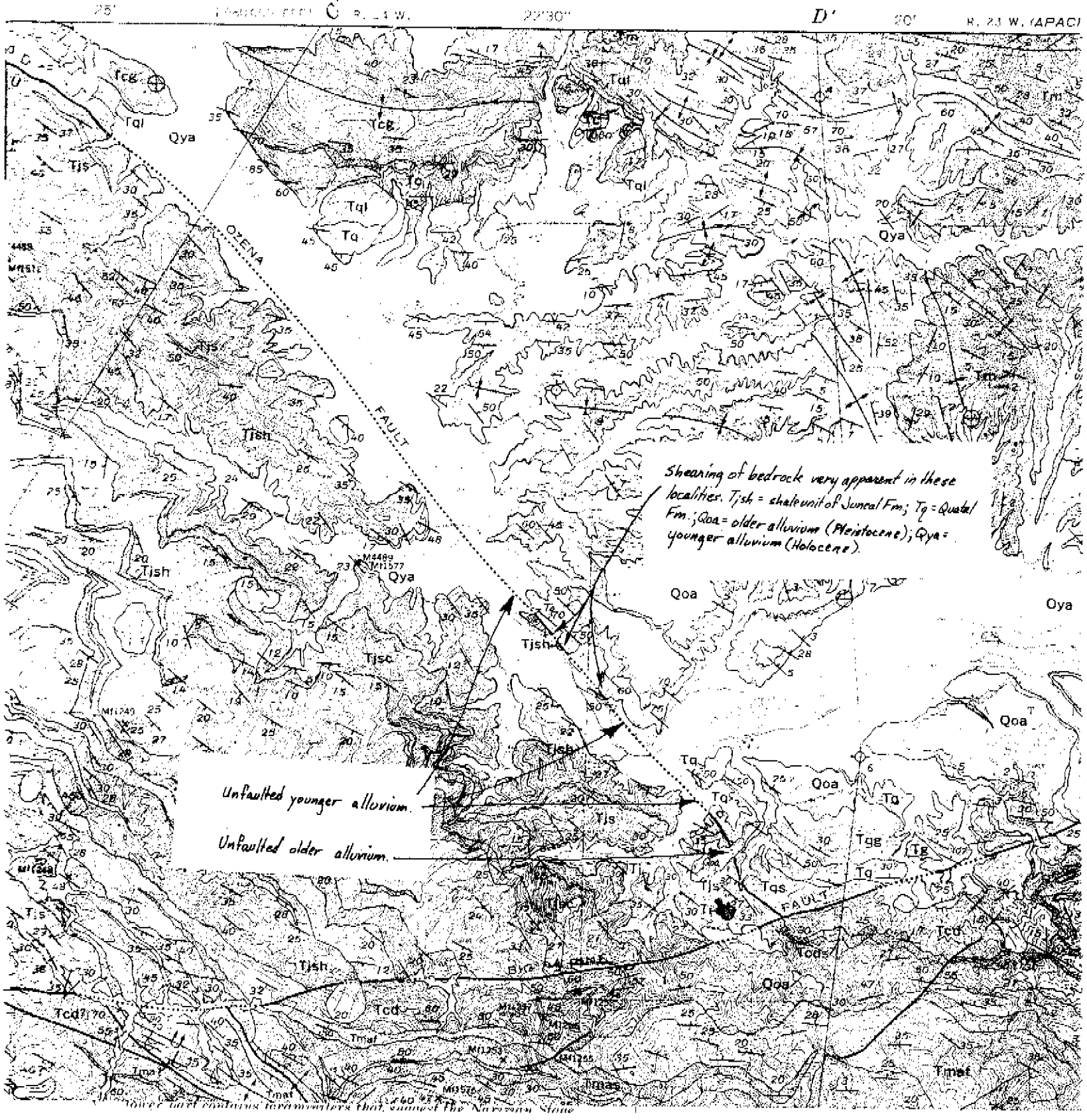

Figure 2. From Vedder, Dibblee, and Brown, 1978. (scale 1:48,000).

highway 33 was made on June 22, 1976. No indications that the fault has moved during the Quaternary were noted (no scarps, offset Quaternary units, etc.). Some shearing in the older bedrock east of the highway and north of Lockwood Valley Road was noted.

8. Conclusions:

The Ozena fault is a high angle reverse fault which may have had some movement along it during the Quaternary (Jennings, 1975 after Dickinson, 1969), however the youngest unit faulted is Morales Formation (Pliocene). The fault is mapped by several authors as not cutting terrace deposits and older alluvium, which is presumably late Quaternary in age. One map (Stanford Geological Survey, 1966) does depict the fault as cutting alluvium, but this is ~~most~~ probably a drafting error (see item 5). The Ozena fault is most likely pre-late Quaternary in age.

9. Recommendations:

On the basis of the data summarized herein, zoning the Ozena fault is not recommended.

10. Investigating geologist's name; date:

Theodore C. Smith
Assistant Geologist
December 28, 1976

I concur with your recommendation.
E Hart
1/10/77